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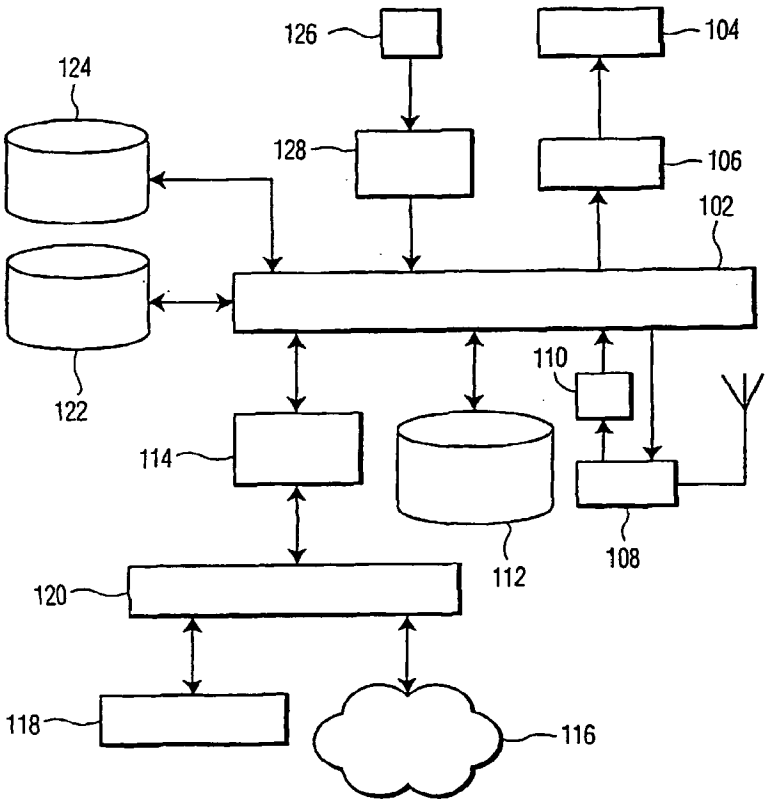
(54) Title: VIRTUAL PERSONALIZED TV CHANNEL



(57) Abstract: A data management system creates a personalized content information channel for an end-user by enabling to automatically play out a plurality of concatenated content information segments. These segments or programs have been selected on the basis of a criterion independent of a respective resource of respective ones of the segments.

WO 02/080552 A2

Virtual personalized TV channel

FIELD OF THE INVENTION

The invention relates to personalizing the presentation of content information, in particular, but not exclusively, TV broadcasts.

BACKGROUND ART

Philips Electronics markets a Personal Video Recorder (PVR) that is powered by the TiVo service. The PVR allows a user to pause, rewind, slow-motion, and even frame-forward and back live TV. Fast forward with "Smart Scan" lets the user choose what to watch or skip. The PVR is compatible with direct broadcast satellite, cable and antenna. The PVR digital video recorder is connected between a TV set and cable box (digital or analog), satellite receiver, and/or antenna. Via the user's existing phone line, the recorder downloads up-to-date programming information from the TiVo service. The service further lets the user manage and create his/her own TV schedule with automatic digital recordings of favorite shows that are saved to a hard disk drive (HDD) without the user having to explicitly set a timer.

The PVR has several user-selectable operational modes listed as options in an on-screen menu. Choosing the option "now playing" brings up a graphical user interface that lists the programs previously recorded on the HDD. The user can select any of the programs for playing out. Choosing the option "watch live TV" lets the user watch any currently broadcast TV program.

SUMMARY OF THE INVENTION

The PVR decribed above lets the user watch live TV programs or recorded programs according to the user selecting the operational mode and the available content information in that mode. For example, a live broadcast is selected from an electronic program guide (EPG) or by simply tuning to a specific channel via the remote's channel up/down keys. An EPG is an application in an interactive TV service that creates, based on data received from the service provider, an on-screen overview of all programs available. A recorded program is selected for play out by selecting the program from the list presented in

the "now playing mode". Accordingly, the user selects each time an individual program by interacting with the EPG or list of recorded items, or surfs the channels until coming across a program to his/her current liking. That is, each time the user has to select an item of content information for play-out. The invention now, facilitates the selecting and at the same time increases the user-friendliness and level of user control regarding program selection.

The invention provides a data management system for creating a personalized content information channel for an end-user by enabling to automatically play out a plurality of concatenated content information segments, or programs, selected on the basis of a criterion independent of a respective resource of respective ones of the programs. The concatenation enables a substantially continuous, or back-to-back, play-out as if the personalized channel were a conventional TV or radio channel. Respective resources comprise, for example, respective TV channels with live broadcasts.

Preferably, the system comprises a recording device for time-shifting the play-out of at least a specific one of the programs so as to have it fit into the concatenation of the programs per personalized channel. The recording device can also be used as a resource for supply of a content information segment to the personalized channel. Multiple personalized content information channels can be created, each respective one thereof being associated with, e.g., a respective topic such as "movies", "educational documentaries", "sports", "shows", etc., or "westerns", "musicals", "movies featuring Katherine Hepburn", "science fiction movies", etc.

Alternatively, or in addition, respective channels are created for respective members of the family so that everyone has his/her own personalized channel with content information according to his/her profile. As mentioned above, a resource may also comprise or provide recorded content information, e.g., as stored on a PVR or on a DVD in a DVD jukebox, on a CD or solid state memory, as a video-on-demand service, etc.

Alternatively, a personalized channel comprises different types of programs or segments, as selected from the available resources. For example, a user has specified that his/her personalized channel on Saturday's be created as follows: first the news from CNN, then the weather forecast on the local weather channel, then a movie at PBS, and afterwards a late-night comedy show after a coffee break.

The system may only have to switch among live TV channels on occasion in order to create the personalized channel. However, in order to provide flexibility and user adaptability, recording for later play-out, and resources other than TV programs are included in the personal channel. The channel may not be limited to video only as a conventional TV

channel, or audio only as a conventional radio channel, but may instead comprise content information of diverse formats for being played out via respective associated apparatus (display monitor, loudspeaker system, etc.).

Preferably, the system comprises a generator for generating an overview of the concatenated programs, preferably in a graphical user interface (GUI). Preferably, the overview allows some degree of user-interactivity, e.g., for letting the end-user control the compilation of the programs in the personalized channel, e.g., an order of playing -out the programs assigned to the concatenation or substituting another program for an earlier assigned one, etc.

An example of the invention relates to the creation of one or more virtual TV channels containing only programs which match predefined criteria, e.g., implicitly derived from a user's TV watching profile, explicitly defined by a user, etc. When multiple virtual TV channels are created, specific virtual channels can be assigned to family members, or a single person can create multiple virtual channels according to different kinds of content (based on topic, e.g., "my sports", "my news", "my movies", etc.).

Preferably, virtual channels can be locked, and it is possible to allow children to only watch the virtual channel(s) set up for them by their parents (virtual channels can also be made to 'black out' at times when the parents do not want their children to watch TV). Once set up, a user interacts with a virtual channel like he or she interacts with a conventional TV channel. When one program ends, the system automatically switches to the appropriate conventional channel or another resource for the next program in the virtual channel.

Preferably, certain programs are stored in a buffer, e.g., a hard-disk drive (HDD) -based video recorder for time-shifted play-out, so as to reduce the occurrence of empty time slots or program overlap in a virtual channel. At any moment in time at most one program can be active for every virtual channel. There are many ways in which this program can be selected for a given virtual channel. For example, the user can explicitly select programs from all available conventional TV channels, e.g., through an EPG, for each or each desired, time slot in a virtual channel.

Alternatively, or in combination with the user-selection, a virtual channel is automatically created based on a user's viewing profile by filling time slots with a matching or otherwise suitable program from all available conventional channels. For example, the user selects a program type for every time slot in a virtual channel, and based on a user's viewing profile a specific instance of that program type is automatically assigned to that time

slot. As another example, the user explicitly selects programs for some of the time slots, and all other time slots are filled based on the user's viewing profile.

The expression "personalized content information channel" or "virtual channel" has been chosen to refer to the invention to indicate the continuous or substantially continuous back-to-back supply of content information as if it were a conventional TV or radio channel, wherein programs are concatenated in time by the broadcaster. In the invention, the selection of programs for back-to-back supply is under control of the individual end-user. Note that the programs in a conventional TV channel all comprise video content, and that all programs in a conventional radio channel comprise only audio. The invention allows to create a personalized channel on the home equipment across the media (audio, video, etc.) and the available resources (TV, radio, Internet, DVD, CD, HDD recorder, Video-on-Demand, etc.). For example, a personalized channel makes available on a specific day a live TV broadcast, a recorded TV broadcast, a DVD movie from the home network's DVD jukebox or player, a concert played from a CD on the home network, an audio program streamed via the Internet, etc.

An aspect of the invention resides in providing a service via a data network, e.g., the Internet. The service enables to create a personalized content information channel for an end-user, and comprises enabling to automatically play out a plurality of concatenated content information segments selected on the basis of a criterion independent of a respective resource of respective ones of the segments. Respective resources comprise, for example, respective TV channels, and the service supplies, for example, a personalized EPG and controls the switching between the proper channels or the proper channels and a recording device. The service controls the recording of at least a specific one of the segments for time-shifting the play-out so as to have it fit into a concatenation of the segments. The service may enable to create multiple personalized content information channels.

The service may supply an overview of the concatenated segments scheduled for the personalized channel. The overview is, e.g., a personalized EPG or ECG (electronic content guide; see, e.g., U.S. serial no. 09/568,932 (attorney docket US 000106) filed 5/11/00 for Eugene Shteyn and Rudy Roth for ELECTRONIC CONTENT GUIDE RENDERS CONTENT RESOURCES TRANSPARENT, referred to below. The overview preferably allows user-interactivity, e.g., for modifying the concatenation under user-control. In this way, the management of playing out and recording of the content information for this individual user is delegated to a server system. The server system may comprise a dedicated server to optimize the matching between content information and user profile. The server

preferably has access to a profile of the user, to the user's home network for play-out and record control purposes, and to an inventory of content information (or parts thereof made accessible by explicit agreement from the user) for selecting pre-recorded local content. Note that a user data base according to content information preferences is a valuable tool for commercial enterprises to offer products and services in targeted ads to the appropriate demographic groups.

Another aspect of the invention resides in a software application for being installed on a home network. The application controls the creating of a personalized content information channel for an end-user by enabling to automatically play out a plurality of concatenated content information segments that have been selected on the basis of a criterion independent of a respective resource of respective ones of the segments. EPG's and inventories of content information available locally, i.e., at the user's home entertainment equipment, enable the software application to select content segments under control of a user-profile and/or history of user-interaction with the equipment.

Reference is made to the following patent documents:

- U.S. serial no. 09/568,932 (attorney docket US 000106) filed 5/11/00 for Eugene Shteyn and Rudy Roth for ELECTRONIC CONTENT GUIDE RENDERS CONTENT RESOURCES TRANSPARENT. This document relates to a data management system on a home network. The system collects data that is descriptive of content information available at various resources, including for example, an electronic program guide (EPG), on the network. The data is combined in a single menu to enable the user to select from the content, regardless of their resource.

- U.S. serial no. 09/519,546 (attorney docket US 000014) filed 3/6/00 for Erik Ekkel et al., for PERSONALIZING CE EQUIPMENT CONFIGURATION AT SERVER VIA WEB-ENABLED DEVICE. This document relates to facilitating the configuring of CE equipment by the consumer by means of delegating the configuring to an application server on the Internet. The consumer enters his/her preferences in a specific interactive Web page through a suitable user-interface of an Internet-enabled device, such as a PC or set-top box or digital cellphone. The application server generates the control data based on the preferences entered and downloads the control data to the CE equipment itself or to the Internet-enabled device.

- U.S. serial no.09/807618 (Attorney docket US 018028) filed 3/8/01 for Eugene Shteyn for ACTIVITY SCHEDULE CONTROLS PERSONALIZED ELECTRONIC CONTENT GUIDE. This document discloses a system and method wherein

electronic content information and the time slots for play-out are being determined based on the activities scheduled in the user's electronic calendar and the user's profile or declared interests. In this manner, the recording and downloading of content is automated based on the user's life style. More specifically, an EPG and/or ECG is under control of the user's personal schedule, e.g., as represented on the user's electronic organizer with the user's scheduled personal activities.

A data processing system is provided for managing electronic content information under control of data representative of at least one activity scheduled in a user's calendar. The system preferably has a control output for control of a data recording device for recording the electronic content. The system also preferably has an input for receiving input data representative of an EPG, and an input for receipt of the data representative of the activity. The latter is then used for data communication between the system and an electronic calendar on, e.g., the user's PDA.

The managing may comprise selecting specific content information based on a profile of the user. The profile comprises, for example, a preference regarding an attribute (e.g., genre, semantic content, performer, etc.) of the content information based on which the user ordinarily decides whether or not to watch or listen to it. The profile may also comprise relative priorities of the activities scheduled in the calendar with respect to each other and/or with respect to certain content information, or relative priorities of content information entities or files. The profile gives further criteria, in addition to the calendar, based on which the system processes, e.g., records or not, content information.

The system preferably creates a GUI for presenting an overview of the specific content information available in the time slots other than those associated with the scheduled activities in the calendar. The system preferably dynamically adjusts the processing upon a user interaction with the calendar. For example, if the user enters a new activity into the calendar or cancels a scheduled one, the availability changes of the time slots that can be used for processing or playing out content information. Based on, e.g., the user's profile, the system may allocate new time slots to suitable content or time-shift the content to a new time slot fitting into the profile of the user.

- U.S. ser. no. 09/160,490 (attorney docket PHA 23,500) filed 9/25/98 for Adrian Turner et al., for CUSTOMIZED UPGRADING OF INTERNET-ENABLED DEVICES BASED ON USER-PROFILE. This document relates to a method of enabling customizing a technical functionality of network- (e.g., Internet-) enabled equipment of an end-user. According to the method a profile of the end-user and information about a technical

feature for use with the equipment are stored at a server system. Based on the user-profile it is determined whether or not the user should be notified about the availability of this feature. If it has been decided that there is a match between the user profile as stored and the information about this feature, the end-user gets notified via the network of the option to obtain the feature for being added to his/her equipment. In case the feature relates to new software, it can be downloaded via the network for preferably automatic installation in the equipment. In case the feature comprises a hardware component, it can be shipped to the end-user upon acceptance of the offer. A helpdesk is preferably provided through the network to help the end-user install the feature. This concept is based on the insight that network-enabled equipment will become a flexible repository into which the end-user can place new and exciting features over time dependent on the user's needs or desires, context of use, advancement of technology, etc.

Not all end-users are always interested in all possible features for creating enhanced functionality of the equipment. Accordingly, a user-profile is established, either when the user registers his equipment with the notification service, or dynamically as a consequence of the user's interaction with the server system, or through a combination thereof. The profile is used to select technical features that are likely of interest to the user. In this manner, the user is kept abreast of the latest trends of interest to him/her. This service implicitly supports virtual recycling as equipment needs to be designed for the purpose of being upgraded.

The modular approach of adding or deleting technical software or hardware features as needed thus assists in slowing down the trend that products becoming obsolete fairly quickly, but without barring the manufacturer or aftermarket sales organizations from continuing doing business. This service is specifically relevant to vertical markets. A vertical market is a particular branch of commercial activity for which similar products or similar services are relevant. Examples of vertical markets are education, offices, hotels, consumers, hospitals, etc. Each of these segments have unique requirements for hardware devices and their functionality. Hardware manufacturers can make their devices more relevant to a specific vertical market segment by combining a relevant set of applications and services.

- U.S. ser no. 09/653,784 (attorney docket US 000220) filed 9/1/00 for Frank Caris et al., for STB CONNECTS REMOTE TO WEB SITE FOR CUSTOMIZED CODE DOWNLOADS. This document relates to marketing a set top box (STB) together with a programmable remote. The remote has a dedicated button to connect the STB to a specific server on the Internet. The consumer can notify the server of his/her other CE equipment,

which he/she desires to be controllable through the same remote as the one that came with the STB. The server downloads to the STB data representative of the relevant control codes. The STB is provided with means to program the remote with these codes. In return the server has obtained detailed and accurate information about this consumer's equipment. A reliable customer base can thus be built for streamlining Help Desk operations.

BRIEF DESCRIPTION OF THE DRAWING

The invention is described in further detail, by way of example and with reference to the accompanying drawing, wherein Fig.1 and 2 are block diagrams of systems in the invention.

Throughout the drawing, same reference numerals indicate similar or corresponding features.

DETAILED EMBODIMENT

Fig.1 is a block diagram of a system 100 in the invention. System 100 comprises a data processing unit 102 with an onboard memory. System 100 further comprises a play-out apparatus 104, here a display monitor, coupled to unit 102 via an encoder 106; a TV tuner 108 whose content information output is coupled to unit 102 via a D/A converter 110, and whose control input is connected to unit 102 for controllably switching channels; a storage 112, e.g., a HDD, for storing digital content information; a network interface 114 for connecting unit 102 to an external network like the Internet 116 and to a home network 118 via a gateway or a hub 120; a storage 122 for storing a currently valid EPG; and a storage 124 for storing a user profile, e.g., in terms of the user's preferences with regard to genre's or types of content information or in terms of a history of user interaction with content offered via the EPG or available from other resources on home network 118, such as a DVD jukebox (not shown). The user interacts with system 100, e.g., via a remote control device 126 and an IR receiver 128 coupled to unit 102 for processing the IR commands.

In this example, the user profile represents the types of content information (e.g., audio, video) and time slots wherein the user wants to have the content information made available to him/her. The profile may also comprise indications of relative priorities this particular user assigns to certain programs. The priorities may be dependent on the time of the day or the day of the week, for example. Under control of the profile, and the available content information, system 100 creates a personalized channel for this user with content information segments, e.g., programs, played out back to back, or, in other words, without the

user having to switch channels, or switch content providing resources. The back-to-back play-out can be interrupted automatically for a certain time period, e.g., if the user has specified this in advance in the profile or by a manual override through remote 126. Unit 102 selects content segments that match the user's profile based on the information available from EPG 122, from an inventory of recorded content 112 and based on information on the resources on home network 118.

EPG's are supplied by the service provider as data, and thus can be interpreted as to their semantic content and thus can serve as a basis for finding a match between the user's preferences and the available programs.

The recorded content information 112 comprises programs recorded on a previous occasion, e.g., under control of EPG 122. A recording control software application (not shown) running on unit 102 tags the content being recorded with the associated EPG data so as to enable semantic querying for the purposes of finding a match. Home network 118 comprises, for example, a DVD jukebox or a CD jukebox. Each DVD or CD has a unique identifier that enables to identify its content information, either through a service (not shown) on the Internet or by the data itself. In addition, the user may manually create a description of an inventory of his/her collection of content information on home network 118, e.g., via a PC, and make that available to unit 102. Accordingly, information about the content information available is present as data to enable a query, that has been given as input a description of the user's profile.

Once system 100 has identified matching content for the time slots specified (if any), system 100 arranges broadcast programs, received via tuner 108 and played out in real time, recorded or time-shifted broadcast programs in storage 112, Internet TV (via a PC on home network 118) and a video-on-demand program (via a set top box on home network 118) in time and in a preferred order by control of the access to the programs' resources (tuner 108; storage 112; home network 118; Internet 116) and control of recording programs in storage 112.

In above example of the invention, user profile storage 124 is part of the user's local equipment. Fig.2 illustrates another example of a system 200 in the invention. In system 200, user profile 124 is stored at a remote server 202 that communicates with unit 102 via the Internet 116. Server 202 also has access to the EPG 204 to which service this user has subscribed. EPG 122 is the locally cached version of (a part of) EPG 204. Based on this, server 202 can find a match and send the recommended match as a control script to unit 102. This script controls tuner 108, the recording of programs in storage 112 and the playing out

of recorded programs from storage 112. Preferably, server 202 has also access to an inventory of content information on home network 118, and to content providing services to which this user has access, e.g., via an STB or via the Internet. Based on this information, server 202 can optimize the matching of the content information with the user's profile and download the control script to unit 102 for control of tuner 108, control of storage 112, control of gateway 120 and control of home network 118. An advantage is that the processing power for running the queries and for generating the control scripts resides at a dedicated server instead of at the user's equipment. Moreover, the user can access his/her profile through the Internet from any connected PC or STB.

Server 202 thus obtains information about the profiles of this user and others who want to delegate the control at least partly to service provider 202. This customer base is highly valuable to third parties such as content providers, e.g., to optimize their services based on demographics, and on-line retailers, e.g., to provide targeted advertisements. Note that the supply of control scripts to enable creation of personalized content information channels is a business model that can be subsidized at least partly by advertisements that can be downloaded, e.g., from server 202 onto home network 118 or unit 102 and interspersed with, or overlaid on, the content information made available under control of the script.

Still other examples of an embodiment of the invention delegate the storage of content 112 to a remote server as well. The play-out time is known in advance and the download time of the remotely stored content is to be taken into account when preparing for play-out

CLAIMS:

1. A data management system (100) for creating a personalized content information channel for an end-user by enabling to automatically play out a plurality of concatenated content information segments selected on the basis of a criterion independent of a respective resource of respective ones of the segments, at least one of the respective resources providing content other than a liver or locally recorded TV program.

2. The system (100) of claim 1, wherein the respective resource comprises a respective TV channel.

3. The system (100) of claim 1, comprising a recording device for time-shifting the play-out of at least a specific one of the segments so as to fit into a concatenation of the segments.

4. The system (100) of claim 1, arranged for creating multiple personalized content information channels.

5. The system (100) of claim 1, wherein at least one resource comprises recorded content information (112).

6. The system (100) of claim 1, comprising a generator for providing an overview of the concatenated segments scheduled for the personalized channel.

7. The system (100) of claim 3, having a user interface (126) for enabling the end-user to control a compiling of the segments in the concatenation.

8. A method of enabling to create a personalized content information channel for an end-user, the method comprising enabling to automatically play out a plurality of concatenated content information segments selected on the basis of a criterion independent of

a respective resource of respective ones of the segments, at least one of the respective resources providing content other than a live or locally recorded TV program.

9. The method of claim 8, comprising recording at least a specific one of the segments for time-shifting the play-out so as to fit into a concatenation of the segments.

10. The method of claim 8, comprising receiving a profile for the end-user selecting the plurality based on the profile.

11. The method of claim 10, further comprising selecting one or more advertisements and adding the selected advertisements to the plurality.

12. A software application for being installed on a home network for control of creating a personalized content information channel for an end-user by enabling to automatically play out a plurality of concatenated content information segments selected on the basis of a criterion independent of a respective resource of respective ones of the segments, at least one of the respective resources providing content other than a liver or locally recorded TV program.

13. A customer data base created from respective user profiles obtained for creating respective personalized content information channels for respective end-users by enabling to automatically play out a plurality of concatenated content information segments selected on the basis of a criterion independent of a particular resource of particular ones of the segments, at least one of the respective resources providing content other than a liver or locally recorded TV program.

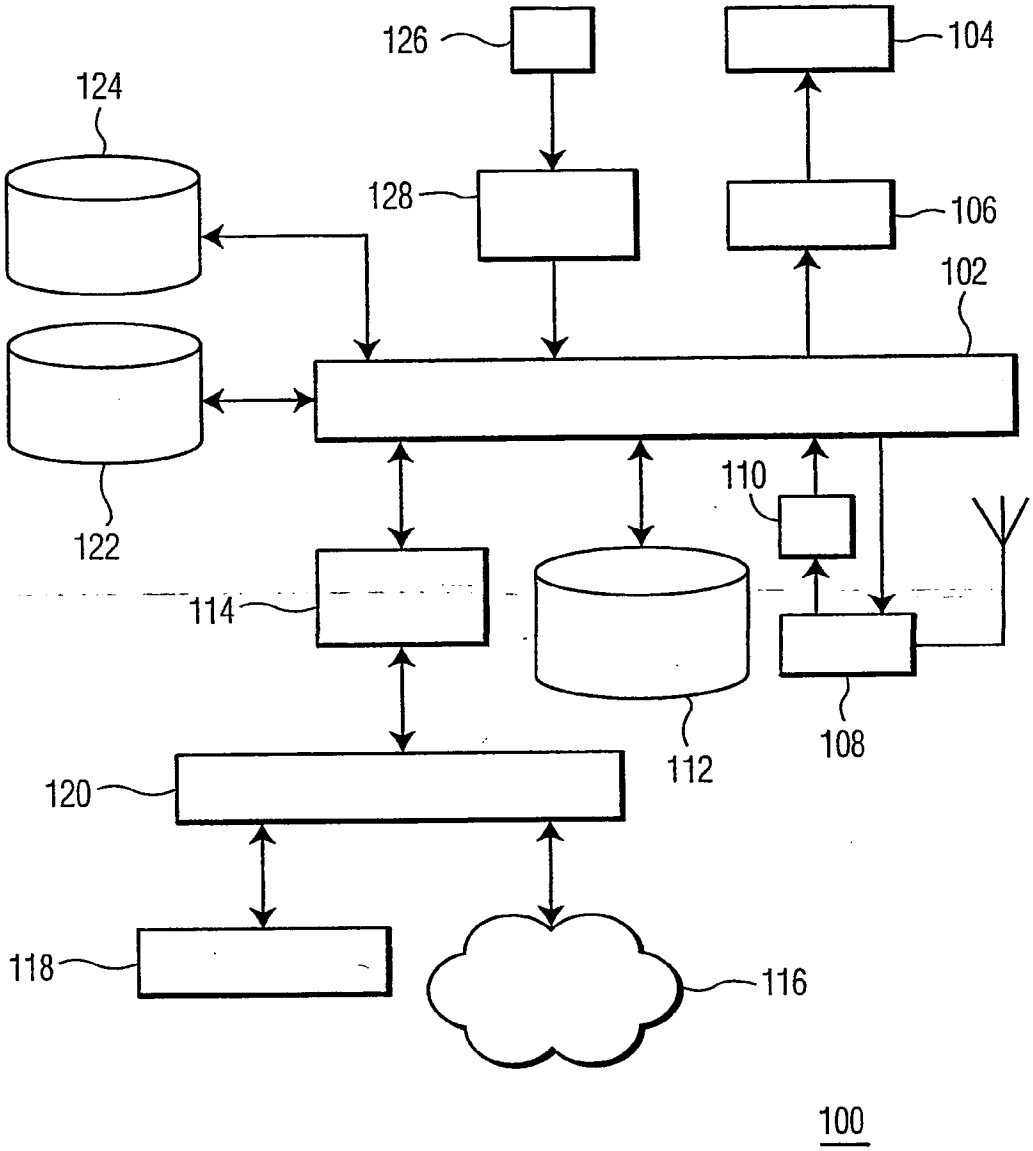


FIG. 1

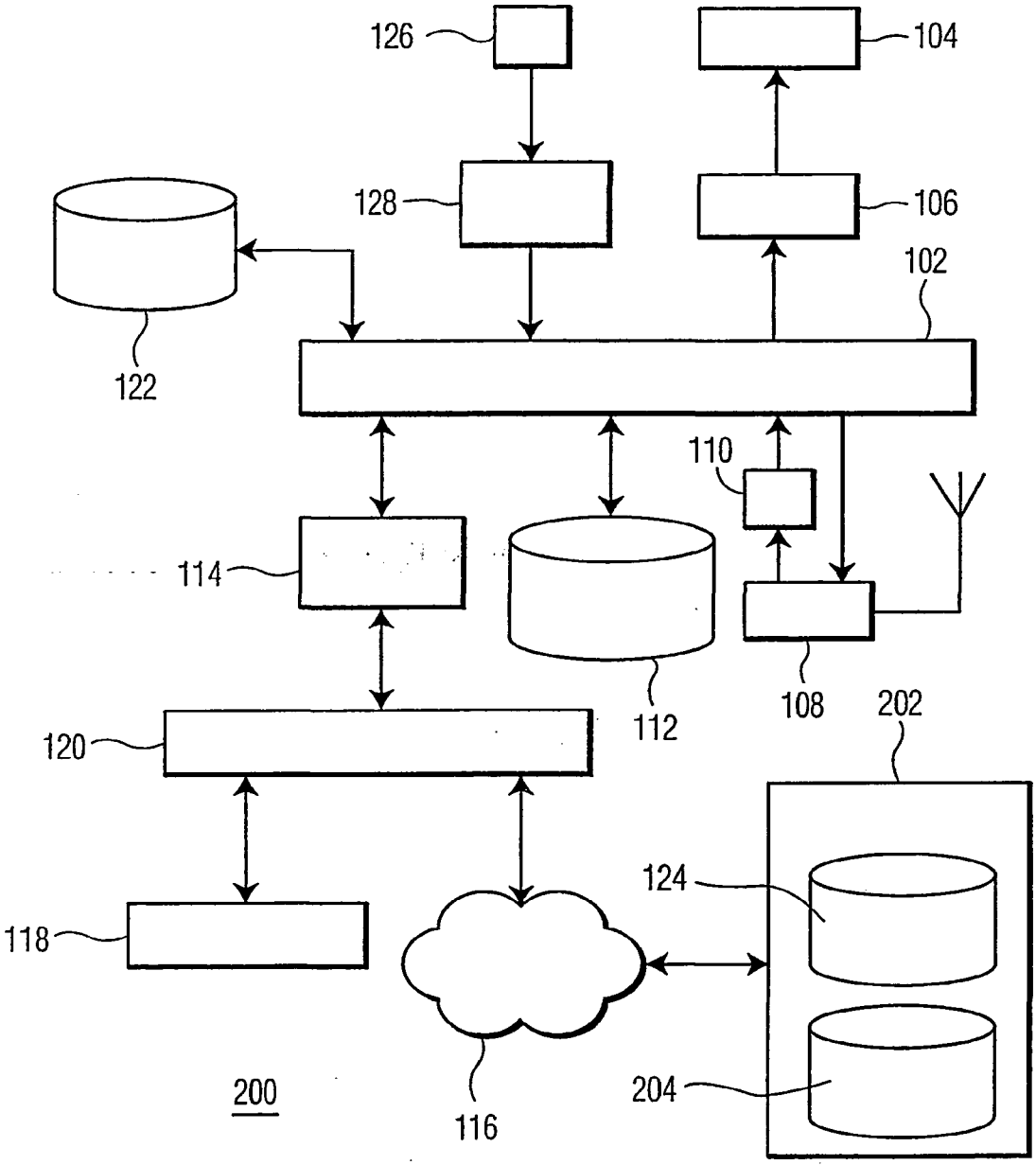

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FIG. 2

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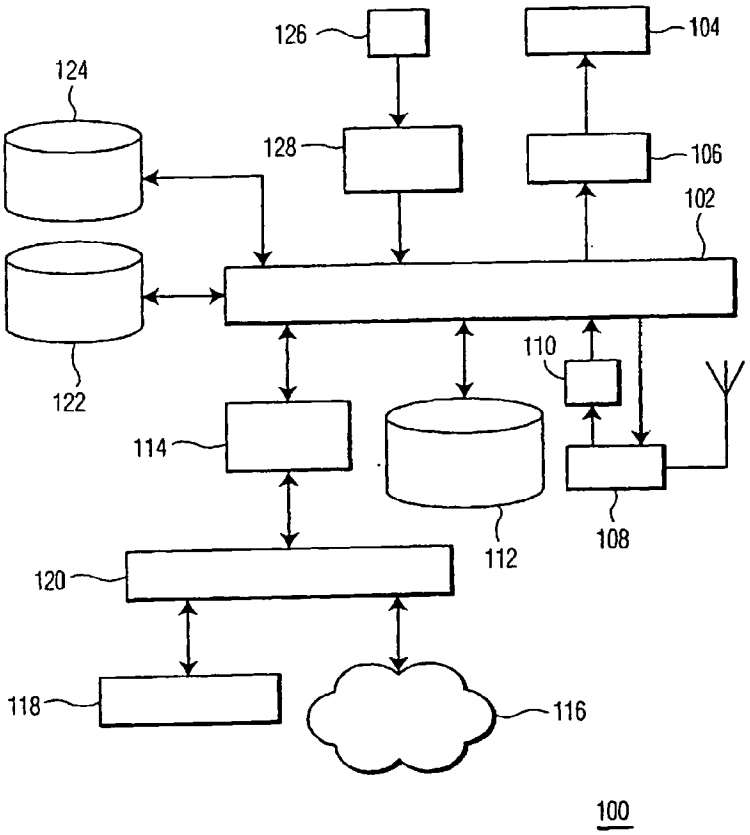
(54) Title: VIRTUAL PERSONALIZED TV CHANNEL



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N7/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 01 15451 A (WU BO ;XU GUOHONG (US); ENREACH TECHNOLOGY INC (US)) 1 March 2001 (2001-03-01) page 4, line 28 -page 5, line 9 page 7, line 15 - line 20 page 8, line 30 -page 9, line 5 page 10, line 7 - line 17 page 11, line 3 - line 23	1-3,5, 8-10,12, 13 4,7,11
Y	"Metabyte announces personalized TV software" 'ONLINE!, 21 January 1999 (1999-01-21), XP002154116 Retrieved from the Internet: <URL:www.mbtv.com> 'retrieved on 2000-11-29! paragraph '0002!	4

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
13 February 2003	20/02/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Sindic, G

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International Application No
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